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1. (Four Times Amended) An isolated and purified bacterial reverse transcriptase (RT) of (SEQ ID. 1), or a substantially homologous amino acid sequence which synthesizes msDNA, and which RT further comprises a sequence of amino acid residues as follows: Tyr-Xaa<sub>6</sub>-Asp-Asp (SEQ ID No:50), wherein Xaa<sub>6</sub> is alanine or cysteine and further comprises a sequence of amino acid residues as follows: Asn-Xaa<sub>1</sub>-Xaa<sub>2</sub>, wherein Xaa<sub>1</sub> is a hydrophobic residue selected from the group consisting of alanine, leucine, and phenylalanine, and Xaa<sub>2</sub> is a hydrophobic residue selected from the group consisting of leucine, valine, and isoleucine.

7. (Four Times Amended) An isolated and purified bacterial reverse transcriptase (RT) which synthesizes msDNA and which is essential for the synthesis of msDNA *in vivo*, said RT comprises a sequence of amino acid residues as follows: Tyr-Xaa<sub>6</sub>-Asp-Asp, wherein Xaa<sub>6</sub> is alanine or cysteine, as shown in SEQ ID No:50, wherein said sequence is located in subdomain 5 shown in Fig. 14 at positions 175-191 of SEQ ID No:32, at positions 175-191 of SEQ ID No:33, at positions 175-191 of SEQ ID No: 34, at positions 168-184 of SEQ ID No: 35, at positions 159-175 of SEQ ID No:36, at positions 171-187 of SEQ ID No:37, and at positions 157-173 of SEQ ID No:38, and further comprising the 61 amino acid residues as shown by black dots in Figure 14 of SEQ ID NOs:32-28, wherein h is a hydrophobic residue and p is a small polar residue.

12. (Four Times Amended) The isolated and purified RT of claim 4 which RT has in the following order starting from the N- to the C-terminus:

(1) an amino acid sequence of Ser-Xaa<sub>3</sub>-Xaa<sub>4</sub>-Xaa<sub>5</sub> (SEQ ID No: 51), wherein Xaa<sub>3</sub> is a hydrophobic residue selected from the group consisting of valine, phenylalanine, leucine, and isoleucine, Xaa<sub>4</sub> is a polar residue selected from the group consisting of threonine, asparagine, lysine, and serine, and Xaa<sub>5</sub> is a hydrophobic residue selected from the group consisting of tryptophan, phenylalanine, and alanine;

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(2) an amino acid sequence of Asn-Xaa<sub>1</sub>-Xaa<sub>2</sub>, where Xaa<sub>1</sub> is a hydrophobic residue selected from the group consisting of alanine, leucine, and phenylalanine, and Xaa<sub>2</sub> is a hydrophobic residue selected from the group consisting of leucine, valine, and isoleucine;

(3) an amino acid sequence Tyr-Xaa<sub>6</sub>-Asp-Asp (SEQ ID No: 50) wherein Xaa<sub>6</sub> is alanine or cysteine; and

(4) an amino acid, Xaa<sub>7</sub>, where Xaa<sub>7</sub> is a polar residue selected from the group consisting of arginine, lysine, glutamic acid, glutamine, and valine.

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